Some of my hearers, however, may think that, instead of rendering the subject clearer, I have brought it perilously near to the obscure region of metaphysics; and certainly, if to argue the insufficiency of the mechanical explanation of a phenomenon is to be metaphysical, I must plead guilty to the charge. I will, therefore, appeal to a judgment—metaphysical, it is true, but to be found in a very exact treatise on physical science—namely, Newton's "Principia." It has a marked bearing on the subject in hand:—

"*A cæca necessitate metaphysica, quæ utique eadem est semper et ubique, nulla oritur rerum variatio.*"

I will merely add this is certainly true of the particular *rerum variatio* in which optically active organic compounds originate.

NOTES.

THE funeral of Dr. John Hopkinson and his three children, whose sad deaths on the Dent Veisivi were recorded in last week's NATURE, took place on Friday last at Territet. The coffins were covered with flowers, and many of the wreaths had been sent from England. After a service in the English church the coffins were carried to the cemetery, where they were interred.—At a special meeting of the Council of the Institution of Electrical Engineers, held on August 31, the following resolution was passed unanimously:—"That the Council of the Institution of Electrical Engineers do hereby place on record this expression of their sincere sorrow and deep regret for the great and irreparable loss sustained by the Institution through the untimely and calamitous death of Dr. John Hopkinson, F.R.S., past President of the Institution of Electrical Engineers, Major commanding the Corps of Electrical Engineers, Royal Engineers (Volunteers), and Professor of Electrical Engineering in King's College, London." It was further decided that, subject to it being consonant with the wishes of the family, the members of the Council should attend the funeral as representatives of the Institution. Owing to the sudden alteration in the arrangements for the interment, however, it was impossible for them to carry out their intention; but Prof. Ewing, member of Council, who was in Switzerland at the time, was accessible by telegraph, and was therefore able officially to represent the Institution and, in its name, to lay a wreath of flowers upon the grave of his former colleague.

THE American Association for the Advancement of Science appear to have had a very successful meeting at Boston. Following the usual custom the retiring president, Prof. Wolcott Gibbs, delivered an address, taking for his subject the constitution of the complex-inorganic acids and their salts, which class of compounds was selected by him because it is well adapted to throw light upon the structure and modes of combination of molecules. We regret that on account of the large amount of space which will be devoted during the next few weeks to the proceedings of the British Association, room cannot be found to print Prof. Gibbs's address in full, but a summary of it will be given in a subsequent number, together with a general account of the meeting at which it was delivered.

THE Secretary of State for the Colonies has appointed Dr. Daniel Morris, C.M.G., Assistant Director of the Royal Gardens at Kew, to be Commissioner of the new Imperial Agricultural Department for the West Indies.

WE are requested to state that all communications regarding the full Report of the International Congress of Zoology should be addressed to Adam Sedgwick, Esq., Trinity College, Cambridge.

PROF. VIRCHOW has formally accepted the invitation to the banquet to be given in his honour on October 5, in the Whitehall Room of the Hôtel Métropole. The number of stewards who have signified their intention to be present at the dinner is now 180. Gentlemen who wish to be present should communicate without delay with Mr. Andrew Clark, 71 Harley Street, London, W.

MR. C. E. STROMEYER, writing from Whitby, says that on Friday evening, September 2, from 7.45, to 8.15 an aurora was visible there, with the centre of the rays apparently resting on the horizon about N. 25° E. The rays revolved from west to east at the rate of about 20° in ten minutes. The sky was rather cloudy, but numerous stars could be seen. Twilight was still noticeable in the west, and the full moon was occasionally shining brightly; otherwise, Mr. Stromeyer thinks, the phenomena would doubtless have been very conspicuous. In connection with this observation, it is interesting to call attention to the announcement in this week's Astronomical Column that a fine sun-spot has been visible during the past few days.

MR. ARTHUR JENKIN sends from Redruth some very interesting observations on the motion of falling spray. He points out that if the spray resulting from the breaking of sea-waves on rocks is observed, it will be noticed that after the spray has reached its greatest elevation it exists in the form of drops. Shortly after the downward motion has begun a sudden change takes place, the drops being seen to burst and falling in a state of fine division. Mr. Jenkin adds: "I have repeatedly observed this; and the kind of twinkle which takes place at the moment of change, and the marked difference in appearance, render the phenomenon very noticeable. I have further observed that just before the spray-drop breaks up it momentarily assumes a shape similar to a vortex ring." These observations require an unusual endowment of quick eyesight and power of attention. Mr. Jenkin endeavours to account for the appearance by an explanation based upon difference of velocity between the mass of water and the component particles, due to change of direction of motion.

AS already announced, the seventieth Congress of German Naturalists and Physicians will open at Düsseldorf on Monday, September 19, under the presidency of Prof. Mooren. We learn from the *British Medical Journal* that Prof. F. Klein, of Göttingen, will give an address on University and Technical High Schools, and Prof. Tillmanns, of Leipzig, an address on a Hundred Years of Surgery. The Sections will commence their business on Tuesday, September 20, at 9 a.m., and will sit again in the afternoon. In the evening there will be a gala performance of Wagner's *Die Walkure* in the town theatre. On Wednesday the Medical Sections will meet together under the presidency of Prof. His, of Leipzig, when a discussion will take place on the results of recent investigations into the physiology and pathology of the circulatory organs. In the evening there will be a banquet, which will be attended by ladies as well as by members of the Congress. On Thursday the Sections will meet morning and afternoon, and in the evening there will be a ball. The second general meeting will take place on Friday morning, when addresses will be given by Prof. Martius, of Rostock, on the causes of beginnings of disease, by Prof. van 't Hoff, of Berlin, on the increasing importance of inorganic chemistry; and by Dr. Martin Mendelssohn, of Berlin, on the importance of sick nursing to scientific therapeutics. In the evening the city of Düsseldorf will give a farewell entertainment, and Saturday will be spent in excursions. During the meeting there will be four exhibitions: (1) a historical exhibition, (2) an exhibition of scientific medical, hygienic, chemical, and pharmaceutical inventions, (3) an exhibition of photography in relation to science, and (4) a collection of physical and chemical teaching appliances for use in intermediate schools.

THE Ottawa correspondent of the *Times* announces that some Indians who have just arrived at Dauphin from the far north report meeting Esquimaux, who told them of the appearance among them of strange men who descended from the clouds on the shores of Hudson Bay. It is hoped that the report has reference to Herr Andrée's safety.

TWO sets of Röntgen ray apparatus are reported to have been provided for the Sudan Expeditionary Force. One of these, which has been taken up the Nile by Major Battersby, will be established at Abadieh. Considerable difficulty and the greatest care had to be exercised to get the apparatus to the hospital in good order. Major Battersby has the assistance of Sergeant-Major Bruce, Royal Army Medical Corps, who is skilled in the manipulation of the necessary apparatus. This will be the main depôt for Röntgen ray work, but Lieut. Huddlestone, R.A.M.C., has taken a small outfit with 6-inch coil to the front.

THE second International Sea Fisheries Congress, organised by the French Society for the Promotion of Technical Instruction in Matters relating to Sea Fisheries, opened at Dieppe on September 2, and it appears, from a report in the *Times*, to have dealt with questions which will help forward the movement for international discussion of the numerous important problems and difficulties which beset the fishing industry. The first congress promoted by the Society was held two years ago at Sables-d'Olonne, on the west coast of France. At this second meeting one of the most important achievements of the congress will be the nomination of an international, instead of a purely French, committee for the organisation of future congresses. The total muster of members attending the present congress at Dieppe exceeds 300, and this number includes representatives, actually present, from the following countries:—France, Sweden, Norway, Great Britain, Belgium, Austria, Italy, the United States, Japan, and Venezuela. The congress opened on Friday, under the presidency of M. E. Perrier, professor of zoology at the Paris Museum of Natural History, and member of the Consultative Committee on Fisheries. After the president's address the congress divided into four sections for the discussion of special topics, viz.: (1) scientific researches, under the presidency of M. Mathias Duval, director of the fishery school at Boulogne; (2) fishery apparatus, preparation and transport, under the presidency of M. Delamare-Deboutteville; (3) technical education, under the presidency of M. Jacques Le Seigneur, Commissioner of Marine at Granville; and (4) fishery regulations, under the presidency of M. Roché, Inspector-General of Fisheries. More than forty communications dealing with these subjects were submitted to the congress.

THE scientific work of Lord Rayleigh is the subject of an interesting article contributed by Prof. Oliver Lodge to the *National Review*. Every active worker in the realm of science is familiar with most of Lord Rayleigh's researches, but Prof. Lodge's popular account of the various directions in which these investigations have advanced natural knowledge will nevertheless be read with interest by scientific as well as general readers. "Every subject and branch of a subject that he has taken up," writes Prof. Lodge, "has been left by him in an improved and clarified state, with every kind of avoidable fog or excuse for such fog cleared away from it. Add to this philosophic insight, consummate mathematical power, great versatility of thought, and extraordinary experimental skill, and we have summed up briefly the scientific equipment of Lord Rayleigh." The discovery of argon brought Lord Rayleigh's name prominently before the reading public two or three years ago, but the accurate and laborious investigations which indicated the existence of this gas in atmospheric air had commanded the attention and esteem of men of science long before the gas was actually isolated. This research was only one of a long series distinguished alike by extreme accuracy, clear insight, precision of thought, and ingenious design. Prof. Lodge mentions that Lord Rayleigh's work refers to chemical physics, capillarity and viscosity, theory of gases, flow of liquids, photography, optics, colour vision, wave theory, electric and magnetic problems, electrical measurements, general energy theorems, and other mathematical papers on elasticity and the like, hydrodynamics, and sound. A few of the results which have gained for Lord Rayleigh the admiration and gratitude of physicists are described; and though the notes are necessarily brief, they will serve to give readers not in the stream of scientific thought an idea of the depth and value of his work.

A NOTEWORTHY feature in Dr. Le Neve Foster's general report and statistics for the year 1897 (Part ii.), relating to mines and quarries in the United Kingdom, is a number of instructive diagrams showing graphically the facts tabulated and described in the report. The part of the volume just published as a Parliamentary Blue-book, deals more particularly with the subject of accidents in mines and quarries. During 1897 there were 1015 separate fatal accidents in and about all the mines and quarries, more than 20 feet deep, in the United Kingdom, involving the loss of 1102 lives, showing, on comparison with the previous year, an increase of 11 in the number of accidents and a decrease of 86 in the number of lives lost. It is satisfactory to notice the statement that the decrease in the death-rates mentioned in the two previous reports continues, and that the death-rates for last year are the lowest hitherto recorded. So far as explosions of fire damp or coal dust are concerned the year 1897 is described as an "annus mirabilis," for the deaths by accidents from explosions formed a smaller proportion of the total number of fatalities than in any previously recorded year, the exact proportion being only 1·9 per cent. An examination of the causes of these accidents brings into view two striking facts—first, that most of them were due to open flame, either of naked lights, of matches, or of safety lamps illegally opened; and, second, that not a single fatal ignition of gas or coal dust can with certainty be ascribed to the flame of an explosive in shot-firing. Falls of ground, on the other hand, were responsible for 490, or one-half of the deaths.

IT will be remembered that about a year ago Prof. F. R. Fraser, F.R.S., published the results of some researches which showed that the bile of several animals possesses antidotal properties against serpents' venom and against the toxins of such diseases as diphtheria and tetanus, and that the bile of venomous, or more correctly of nocuous, serpents is specially powerful as an antidote against the venom of serpents. The experiments have been extended, and the new results are stated by Prof. Fraser in the *British Medical Journal*. The most important conclusions are that the bile of nocuous or venomous serpents is the most powerful antidote to venom, and is closely followed in efficiency by the bile of innocuous serpents, while the bile of animals having no venom-producing glands—as man and the ox, pig, and rabbit—while definitely antidotal, is less so than the bile of innocuous serpents, and much less so than the bile of nocuous or venomous serpents. It is remarkable that the bile of one species of venomous serpent may actually be a more powerful antidote against the venom of another species than is the bile produced by this species, and that there is no direct correspondence between the toxic activity of the venom produced by a serpent and the antidotal power of the bile of that serpent. Extending these experiments to the toxins of disease, Prof. Fraser found that the bile of the venomous serpents examined had more antidotal power against the toxins of disease than the bile of the majority of non-venomous animals. It is noteworthy that among the non-venomous animals, the rabbit produced a bile definitely superior to the others in antidotal quality against not only toxins but also venoms.

THE Michigan State Agricultural College has just issued a bulletin embodying an elaborate series of experiments on the use of tuberculin. As a diagnostic agent, expert opinion appears to be practically unanimous that tuberculin is of the greatest value, and such favourable testimony regarding its efficacy as that of Prof. Grange, of the Michigan College, who states he has used it in upwards of a thousand instances during two years, and did not meet with a single case which impeached the trustworthiness of the test, is only one out of many similar statements. Tuberculin is now, in fact, an article of commerce, and its production on a business scale is conducted all over the world. The Pasteur Vaccine Company of Chicago, for example, elaborate tuberculin, and send out detailed instructions for its application. But despite the increasing favour with which it is regarded, a great deal yet remains to be done in perfecting its production, so as to ensure greater uniformity in its reaction, whilst careful scientific records of its influence on animals treated with it are much wanted. It is to help in supplying such data that Mr. Marshall, assistant bacteriologist of the Michigan College, has taken up the subject, and now publishes the results of very careful observations on "the relation of the tuberculin test to normal temperatures."

SOME time ago Dr. Franz Kerntler published a paper on the fundamental laws of electrodynamics, of which we gave a short notice in NATURE. In it the author attempted to discriminate between the various laws of force between two current-elements, all of which laws were in conformity with the accepted theory of action between closed circuits as laid down by Maxwell and others. Dr. Kerntler is continuing his difficult investigation by examining into the possibility of an experimental discrimination between the different laws of force, and we have received a copy of his further paper on the subject, published by the Pester Lloyd Gesellschaft of Budapest.

SOME diversity of opinion has existed among physiologists as to the physiological signification of eating salt; according to Bunge, the use of sodium chloride with food is to counteract the effects of the potassium salts predominating especially in vegetable diet, while other physiologists regard salt purely in the nature of a condiment with no special action. M. Léon Fredericq, writing in the *Bulletin de l'Académie Royale de Belgique*, describes his observations on certain salts used by the natives of the Congo State. These salts are produced by the incineration of aquatic plants, and are placed on the market in the form of cakes produced by evaporation of the solution formed by dissolving the residue. An analysis shows them to consist almost entirely of chloride and sulphate of potassium, the former largely preponderating, and the presence of sodium being only detectable by the spectroscope. The fact that salts of potassium are thus used for cooking purposes seems to negative the views of Bunge, and to support the opinion, previously advanced by Lapicque, that the use of salt is primarily to improve the flavour of food.

MESSRS. F. KING AND SONS, Halifax, are publishing a second edition of Mr. H. Ling Roth's valuable monograph on "The Aborigines of Tasmania." The first edition, published in 1890, consisted of 200 copies, issued to subscribers only. In the preparation of the second edition, Mr. Ling Roth has been assisted by Mr. James Backhouse Walker, of Hobart, Tasmania.

THE American Entomological Society has just published, in pamphlet form, a biographical notice of the late Dr. George H. Horn, by Mr. Philip P. Calvert, and a list of his entomological papers (1860–1896), with an index to the genera and species of Coleoptera described and named, by Mr. Samuel Henshaw. The biography is a very good one, and will be read with interest by entomologists.

A LIST of Röntgen apparatus just issued by Messrs. Isenthal, Potzler, and Co., contains descriptions of several novel pieces of apparatus. The smallest coil described in the list gives a six-inch spark in air; while the largest gives a spark having a minimum length of 40 inches. The catalogue is a striking testimony to the advances which have been made in Röntgen photography during the last two years or so, and it should be seen by medical men and others who contemplate obtaining an outfit for work with Röntgen rays.—Another new catalogue to which attention may profitably be called is Mr. R. Kanthack's catalogue of optical instruments. The high order of the instruments described in the catalogue is vouched for by the fact that the microscopes are exclusively of Messrs. Zeiss and Leitz's manufacture, while the prisms, lenses, mirrors, and astronomical instruments bear the name of Steinheil, Mr. Kanthack being sole agent for the productions of this celebrated firm of Munich opticians.

A "Review and Bibliography of the Metallic Carbides," by Mr. J. A. Mathews, has been published as No. 1090 of the Smithsonian Miscellaneous Collections, upon the recommendation of the Committee on Indexing Chemical Literature, appointed by the American Association for the Advancement of Science. On account of the renewed attention given to this class of bodies during the last five years, Mr. Mathews's review of the work accomplished up to the end of 1897 will be of considerable interest; and, in conjunction with the bibliographical references, will be of value to the chemical student and investigator. The general plan adopted is to give a concise account of the methods of preparation, and physical and chemical properties of the carbides now known, considering them in alphabetical order. Following each descriptive portion are the references to the literature bearing upon the substances to which it refers. The result is a very handy bibliographical dictionary of metallic carbides, and chemists will thank Mr. Mathews for preparing it, and the Smithsonian Institution for making it available.

THE additions to the Zoological Society's Gardens during the past week include a Humboldt's Lagothrix (*Lagothrix humboldti*) from the Upper Amazon, presented by Mr. E. H. L. Ewen; a Ruppell's Colobus (*Colobus guereza*) from Nigeria, presented by Mr. H. S. Kelly; a Hoolock Gibbon (*Hylobates hoolock*, ♀) from Assam, presented by Mr. Lionel Inglis; a Duke of Bedford's Deer (*Cervus xanthopygius*) from Mantchuria, presented by H.G. the Duke of Bedford; a Brazilian Hang-nest (*Icterus jamaica*), a White-throated Finch (*Spermophila albogularis*) from Brazil, presented by Mr. Percy M. Calder; five Rufous Tinamous (*Rhynchotus rufescens*) from Brazil, presented by Mr. Ernest Gibson; two Augural Buzzards (*Buteoauguralis*), three Goliath Beetles (*Goliathus druryi*) from West Africa, presented by Dr. Chalmers; a Lazuline Finch (*Guiraca parellina*) from Central America, presented by Mr. John B. Toone; an Iceland Falcon (*Hierofalco islandus*) from Iceland, presented by Mr. C. R. Anderson; two Great Kangaroos (*Macropus giganteus*, ♂ ♀) two Great Wallaroos (*Macropus robustus*), eleven Brush Turkeys (*Talegalla lathami*), twelve Roseate Cockatoos (*Cacatua roseicapilla*), six Greater Sulphur-crested Cockatoos (*Cacatua galerita*) from Australia, a Red-bellied Wallaby (*Macropus billardieri*), two Bennett's Wallabys *Macropus bennetti*), a Dormouse Phalanger (*Dromicia nana*) from Tasmania, two Brush-tailed Kangaroos (*Petrogale penicillata*), five Silky Bower Birds (*Ptilonorhynchus violaceus*) from New South Wales, a Brown-necked Parrot (*Pæocephalus fusicollis*) from West Africa, two Pretre's Amazons (*Chrysotis prætrii*), a Red-vented Parrot (*Pionus menstruus*) from South America, deposited.